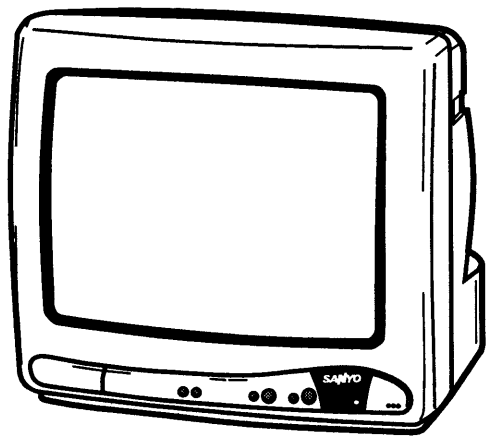
SANYO

Colour Television

Service Manual



Product Code: 111334100
Chassis: EC5-A

Original Manual

Give complete "SERVICE REF. NO." for parts order or servicing, it is shown on the rating sheet on the cabinet back of the TV set.

Note
This TV receiver will not work properly in foreign countries where the television transmission system and power source differ from the design specifications. Refer to the specifications for the design specifications

SPECIFICATIONS

Power Source	AC220~240V 50Hz
Television System	System I
Colour System	PAL
Receiving Channels	UHF : 21~69
Aerial input impedance	75ohm
AV Terminal	21 pin SCART (AV1)
Speaker	8ohm, 8 x 8 cm
Sound output	1.5W (cont.)
Picture tube	37 cm diagonal, 90°
Visible picture	34 cm (diagonal)
Dimensions (W x H xD)	370 x 335 x 392 mm
Weight	9 kg

CONTENTS

	Page
Safety precautions	2
Block diagram	
Main signal routing	3
Power signal routing	4
Circuit description	5~6
Service control adjustments	7~8
Circuit alignment	9
Memory IC replacement	10
Special functions	11
Cabinet parts list	12
Chassis electricl parts list	13~19
Schematic Diagram	loose

Part No. SKSM0223 F2PAW MARCH 1998

SAFETY PRECAUTION

1: An isolation transformer should be connected in the power line between the receiver and the AC line when a service is performed on the primary of the converter transformer of the set.
2: Comply with all caution and safety-related notes provided on the cabinet back, inside the cabinet, on the chassis or the picture tube.
3: When replacing a chassis in the cabinet, always be certain that all the protective devices are installed properly, such as, control knobs, adjustment covers or shields, barriers, isolation resistor-capacitor networks etc.Before returning any television to the customer, the service technician must be sure that it is completely safe to operate without danger of electrical shock.

X-RADIATION PRECAUTION

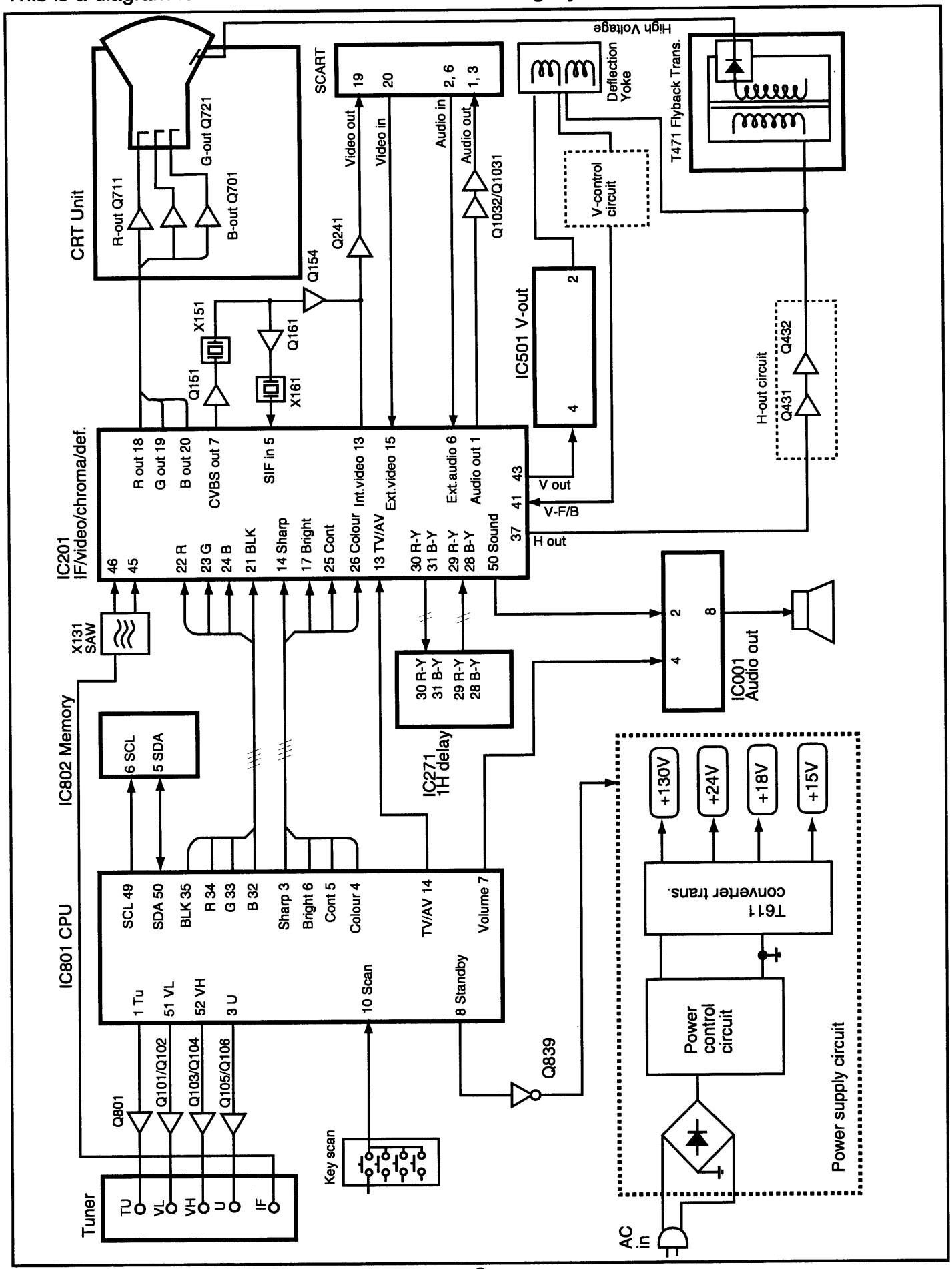
The primary source of X-RADIATION in the television receiver is the picture tube. The picture tube is specially constructed to limit X-RADIATION emissions. For continued X-RADIATION protection, the replacement tube must be the same type as the original including suffix letter. Excessive high voltage may produce potentially hazardous X-RADIATION. To avoid such hazards, the high voltage must be maintained within specified limit. Refer to this service manual, high voltage adjustment for specific high voltage limit. If high voltage exceeds specified limits, take necessary corrective action. Carefully follow the instructions for +B1 volt power supply adjustment, and high voltage adjustment to maintain the high voltage within the specified limits.

PRODUCT SAFETY NOTICE

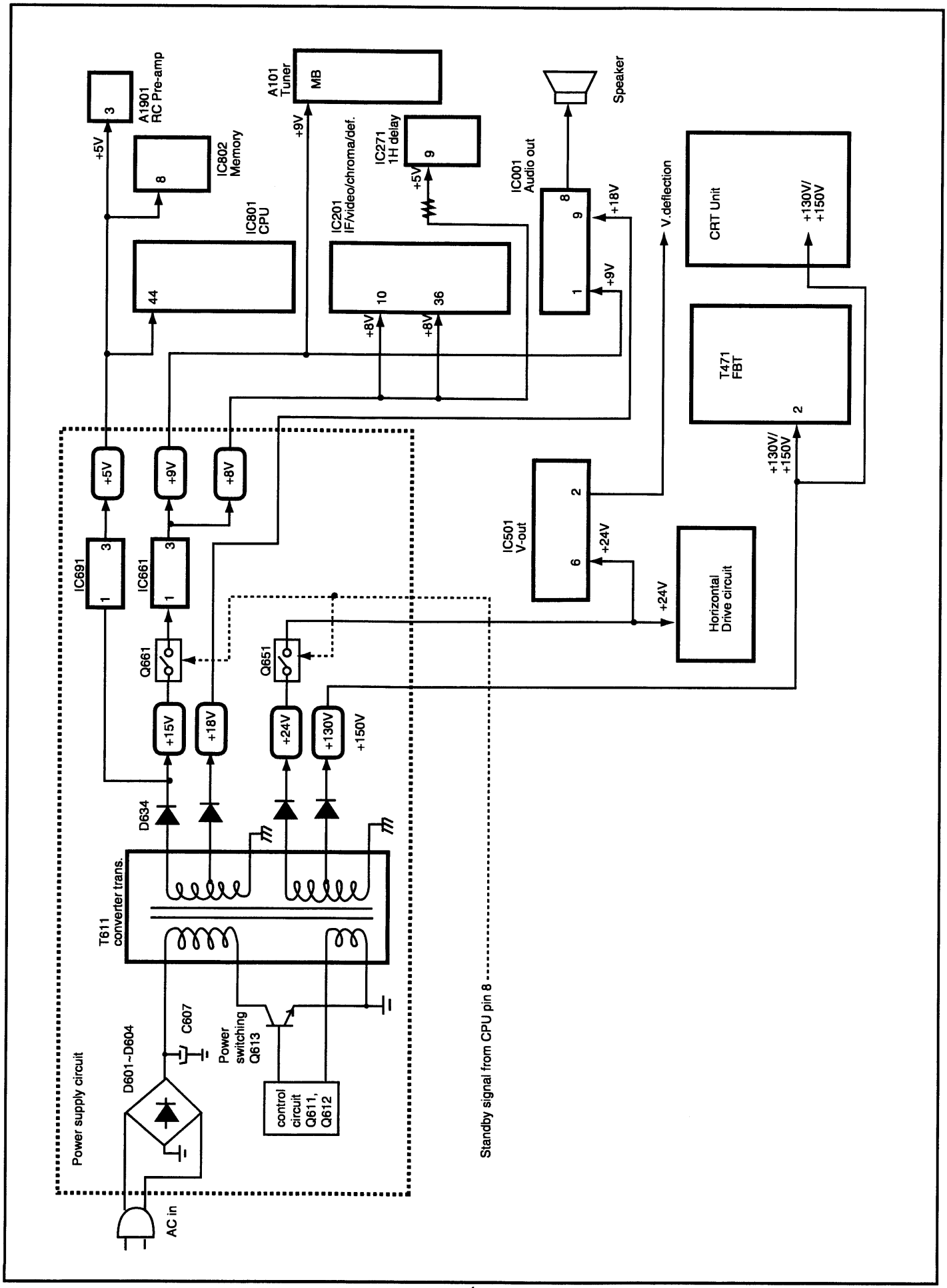
Product safety should be considered when a component replacement is made in any area of a receiver. Components indicated by mark /!\ in the parts list and the schematic diagram designate components in which safety can be of special significance. It is particularly recommended that only parts designated on the parts list in this manual be used for component replacement designated by mark /!\ . No deviations from resistance wattage or voltage ratings may be made for replacement items designated by mark /!\ .

BLOCK DIAGRAM (Main signal routing)

This is a diagram for all models and therefore differs slightly from the actual block diagram.



(Power supply routing)



CIRCUIT DESCRIPTION

1. POWER SUPPLY

The power supply circuit of the EC5-A chassis is composed of a rectifier smoothing circuit, an oscillation circuit, a control circuit and an output rectifier circuit. The AC input voltage is full-wave rectified by the rectifier smoothing circuit, and an unstable DC voltage is generated at both terminals of the smoothing capacitor C607. This voltage is input to the oscillation circuit. The oscillation circuit is provided with a blocking oscillator circuit that switches the switching transistor Q613 ON and OFF, and an oscillation frequency and a duty square wave pulse are generated in the input windings according to operation of the control circuit. A square-wave pulse whose size is dependent on the turn ratio of the input and output windings is obtained in the output winding. This is rectified in the output rectifier circuit, and the desired DC voltage is obtained.

2. IF & DEFLECTION (TDA8361)

The IF output signal from the tuner passes through the SAW filter, and it is input to pin45 and pin46 of IC201. The signal input to the IC passes through the IF amplifier, video detection and video amplifier circuits and is output from pin7 as a composite video signal. And after this signal is converted to impedance at Q151, supplies to the video and chroma amplifier stages.

The sync.-separation circuit separates the video signals applied to pin13(internal video signal) or pin15(external video signal) to vertical- and horizontal-sync. signals respectively. The horizontal oscillator requires no external components and is fully integrated. The oscillator is always running when the start-pin36 is supplied with 8V. Horizontal drive signal is output from pin37. VR361 is for adjustment of the horizontal centring. The separated vertical-sync. signal from sync. separation circuit passes through the vertical-separation circuit, and applied to trigger divider circuit. The horizontal oscillation pulse and input vertical sync. pulse are monitored by the trigger divider circuit, and switching 50Hz and 60Hz system, the vertical amplitude automatically adjusted for 50Hz and 60Hz. The output signal from the trigger divider is triggered vertical oscillation circuit consisting of C351, R356 and pin42, and vertical drive pulse is output from pin43. VR501 is for changing the amount of AC feedback applied to pin41 and for adjustment of the vertical amplitude.

3. VIDEO CHROMA & R.G.B. (TDA8361)

The composite video signal output from the pin7 of IC201 passes through Q151-Q154, and it is supplied to pin13. The external video signal output from SCART is supplied to pin15. The video signal input to pin13 or pin15 is separated to luminance (Y) signal and chroma signal in IC201. These pins are used in common with H/V-sync. separation input. The peaking of Y signal is adjusted by DC voltage of pin14. ("SHARPNESS" control) The chroma signal is divided into R-Y and B-Y chroma signals, demodulated in IC201, and output from pin30 (R-Y) and pin31 (B-Y). These chroma signals pass through the 1H delay line circuit (IC271), and they are input to pin29 (R-Y) and pin28 (B-Y). These R-Y/B-Y signals pass through RGB matrix circuit and RGB selector circuit of IC201. The internal RGB signals are generated in RGB matrix circuit and the RGB selector, consisting linear amplifiers, clamps and selects either the internal RGB signals or the external RGB signals input from pin22(R), pin23(G), pin24(B). Selection is controlled by the voltage at the RGB switch control (pin21) and mixed RGB modes are possible since RGB switching is fast. The RGB switch also functions as a fast blanking pin by blanking the RGB output stages; here internal and external RGB signals are overruled. The colour gain is controlled by DC voltage of pin26. ("COLOUR" control) The contrast control voltage present at pin25, and the brightness control voltage present at pin17 controls DC level of RGB signals. The RGB signals are finally buffered before being available at the RGB output pins [pin20 (R), pin19 (G), pin18 (R)].

4. AUDIO OUTPUT(AN5265)

The audio signal output from pin52 of IC201 is input to pin2 of IC001 and passes through the pre-amplifier circuit and drive circuit, after which it is input to the audio amplifier. The audio amplifier is an SEPP (single-ended, push-pull) OTL type and output to pin8 to directly drive the speaker.

5. VERTICAL OUTPUT (LA7832/LA7833)

An IC (LA7832/LA7833) is used for the vertical output circuit in this chassis. The vertical drive pulse from pin43 of IC201 is input to pin4 of IC501. This pulse drives IC501, and vertical scanning is performed. In the first half of scanning a deflecting current is output from pin2 and passes through the following path:

Vcc(B4) → D501 → pin3 → pin2 → DY → C512 → VR501/R509. An electric charge is then stored in C512. In the last half of scanning the current path is C512 → DY → pin2 → pin1 → VR501/R509 → C512. In this way, an amplifying sawtooth waveform current flows directly to DY to perform electron beam defection. Next, in the first half of the banking period the vertical drive pulse suddenly becomes OFF, and in order to reduce the current flowing to DY, the current path becomes as follows by the inductance of DY:

DY → pin2 → pin1 → VR501/R509 → C512 → DY. Also, when the charge of DY has dissipated, the current path becomes Vcc24V → pin6 → pin7 → C502 → pin3 → pin2→ DY → C512 → VR501/R509, and when the prescribed current value is reached, the vertical drive pulse becomes ON. This completes one cycle.

6. HORIZONTAL OUTPUT

A horizontal oscillation signal is output from pin37 of IC201 and switches the drive transistor Q431. This switch-

ing signal is current amplified by the drive transformer T431 and drives the output transistor Q432. When Q432 becomes ON, an amplifying current flows directly to DY through C441/C442 → DY → Q432 → GND, and defection is performed in the last half of the scanning period. Next, when Q432 becomes OFF, the charge that had been stored in DY up to that point releases a resonance current to the resonant capacitors C421/C423 and charges them. The current stored in C421/C423 is then flowed back to DY, and an opposite charge is then stored in DY. This opposite charge then switches the dumper diode in Q432 ON, the resonance state is completed, and an amplifying current is then flowed again directly to DY through the dumper diode. By this means, deflection in the first half of the scanning period is performed, and when Q432 becomes ON at the end of the first half of the scanning period, deflection during the last half is begun, thus completing one cycle.

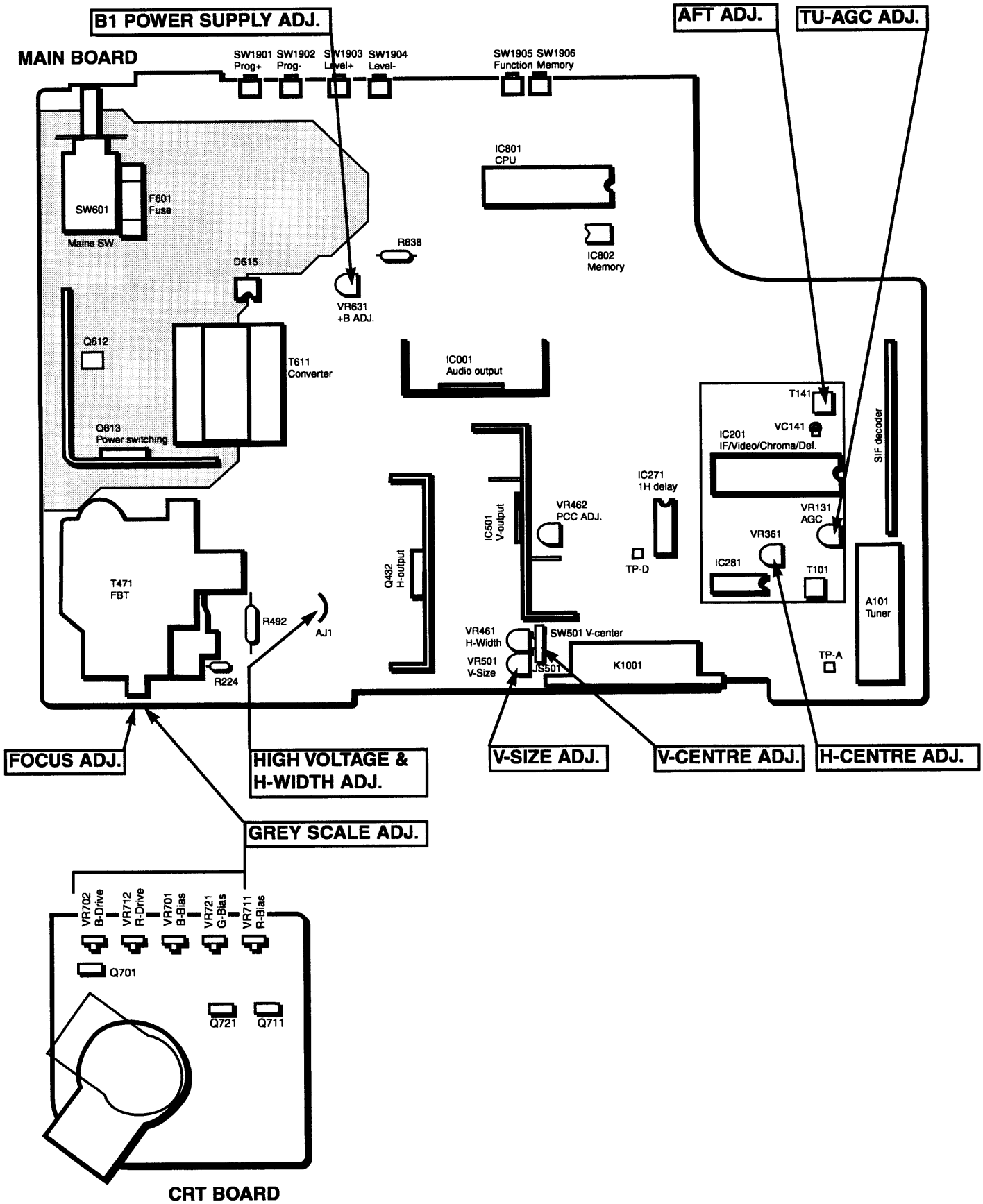
In the PCC circuit consisting of Q461 and Q462, the parabola signal supplied from the vertical circuit is added at the horizontal output stage and pincushion compensation is performed by varying the DC voltage bias. Further, the ABL voltage is feedback to the base of Q462 to compensate for width variations due to variations in the beam current.

7. CPU <System and Teletext Control>

Pin description

Pin1: Tuning voltage output
Pin2: Band switch output 3 (UHF)
Pin3: Sharpness control output (6-bit DAC)
Pin4: Colour control output (6-bit DAC)
Pin5: Contrast control output(6-bit DAC)
Pin6: Brightness control output(6-bit DAC)
Pin7: Volume control output(6-bit DAC)
Pin8: Power ON/OFF output (Power-On:Lo)
Pin9: AFT signal input
Pin10: Option SW1&Keyboard scan input (DC)
Pin11: Option SW2
Pin12: 50/60Hz switch input (50Hz: Hi)
Pin13: GND
Pin14: TV/AV switch output (TV: Hi)
Pin15: 5.5/6.5 switch output
Pin16: Nega./posi switch output
Pin17: Function signal input for SCART
Pin18: L switch output
Pin19: L' switch output
Pin20: LED drive
Pin21: Ignore output
Pin22: GND
Pin23: CVBS input0 (Internal)
Pin24: CVBS input1 (Internal/External)
Pin25: Black
Pin26: IREF
Pin27: Odd/Even output
Pin28: GND
Pin29: -
Pin30: V-deflection stop output(Stop:Lo)
Pin31: RGB REF
Pin32: Blue output for OSD
Pin33: Green output for OSD
Pin34: Red output for OSD
Pin35: Blanking output for OSD
Pin36: H-sync. input (Horizontal pulse for OSD)
Pin37: V-sync. input (Vertical pulse for OSD)
Pin38~39: Supply (+5V)
Pin 40: OSC GND
Pin 41: Oscillator input for CPU
Pin 42: Oscillator output for CPU
Pin 43: Reset input
Pin 44: Supply (+5V)
Pin 45: Protect signal input (L:Power circuit defects)
Pin 46: Ident. signal input
Pin 47: R/C signal input
Pin 48: Mute output in no picture
Pin 49: I²C bus SCL (Serial clock)
Pin 50: I²C bus SDA (Serial date)
Pin 51: Option SW5 & Band switch output1
Pin 52: Band switch output2

SERVICE CONTROL ADJUSTMENT



B1 POWER SUPPLY ADJUSTMENT

1. Set VR631 to be mechanical centre before pressing the main switch.
2. Tune the receiver to PAL circular pattern.
3. Set brightness and contrast controls to normal.
4. Connect digital V-meter to the right side terminal of R638.
5. By using VR631, adjust voltage to 130 ± 0.5 V.

AFT ADJUSTMENT

1. Tune the receiver to the clearest station.
2. By using T141, adjust AFT to obtain the best picture.

AGC ADJUSTMENT

NOTE: *Do not attempt this adjustment with weak signal.*

1. Tune the receiver to the clearest station.
2. Set AGC VR(VR131) in direction which causes snow noise to appear, then in the opposite direction until snow noise just disappears.

GREY SCALE ADJUSTMENT

[SCREEN VR ADJUSTMENT]

1. Tune the receiver to the white pattern.
2. Set brightness and contrast controls to normal.
3. Set VR702 and VR712 to be mechanical centre.
4. Turn VR701, VR711 and VR721 fully counter-clockwise.
5. Connect a short lead between pin30 of IC801 and GND to enter the service mode.
6. Set screen VR for one colour to be just visible.

[BIAS VR ADJUSTMENT]

7. By using VR701, VR711 or VR721, adjust line to be white.
8. Disconnect a short lead.

[DRIVE VR ADJUSTMENT]

9. By using VR701 and VR711, adjust white balance.

HIGH VOLTAGE & WIDTH ADJUSTMENT

[HIGH VOLTAGE ADJUSTMENT]

1. Tune the receiver to circular pattern.
2. Set brightness and contrast controls to maximum.
3. Connect digital V-meter to both terminals of R224, and high voltage meter to CRT anode.
4. Confirm high voltage to be 21.0 ± 1 KV at beam current 0.7mA, and less than 25.0 KV at 0 beam current.

[H-WIDTH ADJUSTMENT]

5. If H-width is too wide or narrow, connect or disconnect a lead wire AJ1.
6. Reconfirm high voltage.

H-CENTRE ADJUSTMENT

1. Tune the receiver to circular pattern.
2. Adjust H-centre by using VR361.

V-CENTRE ADJUSTMENT

1. Tune the receiver to circular pattern.
2. Adjust V-centre by using SW501.
   For 14 inch model, connect or disconnect JS501 to obtain proper vertical screen centre.

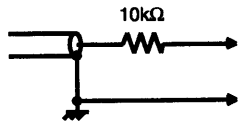
V-SIZE ADJUSTMENT

1. Tune the receiver to circular pattern.
2. Adjust V-size by using VR501.

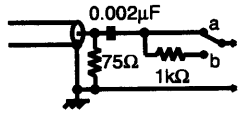
FOCUS ADJUSTMENT

By using FOCUS VR, adjust focus control for well scanning lines.

CIRCUIT ALIGNMENT

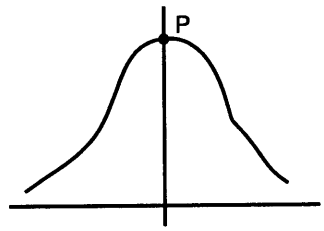


Input probe

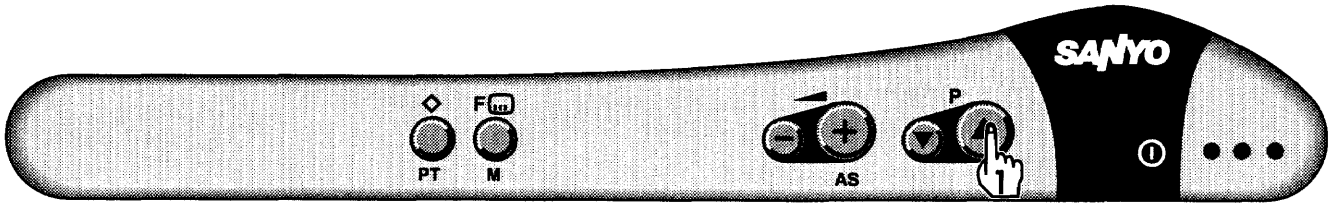


Output probe

VIF alignment

SETTING		Adjustment	Waveform
DC 15.5V AGC voltage (4.3-4.5V) Output probe Input probe Marker frequency Sweep ATT 0dB=176mVrms/75	C644 + IC201-pin48 IC201-pin45 (Side b) IC201-pin7 39.5MHz 20dB	By using T141, adjust "P" to be maximum amplitude.	

MEMORY IC REPLACEMENT (Important Notice)



When you replace a memory IC (IC802), it is necessary to initialise the IC as follows.

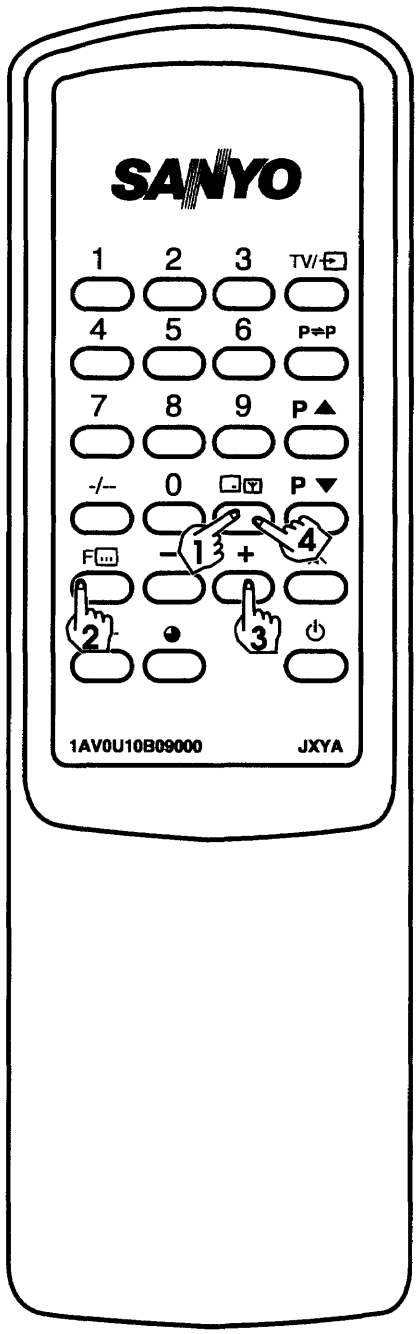
A. Initialisation of Memory IC

1. When you press and hold the **Recall** button on the RC transmitter and then press the **Prog** + button on the TV set, the following picture will appear on the screen.

ITEM -1	SET→ 0

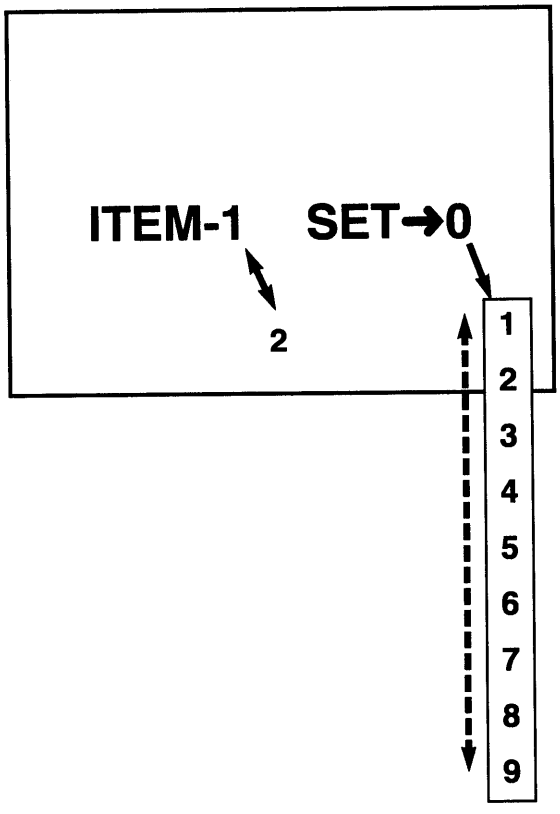
2. Confirm SET number of all items is "**0**" by pressing the **Function** button.
3. If it is not "0", change to "0" by the **Level (+/-)** button. (Changing the SET number, automatically memorised.)
4. Press the **Recall** button, to return the normal TV mode.

For more information, please refer to "special functions" on the instruction manual.



Special Function

- **Maximum volume setting and prohibition of presetting**
- **Start up programme position**



This TV set allows you to set up the following special functions.

■ Maximum volume setting and prohibition of presetting

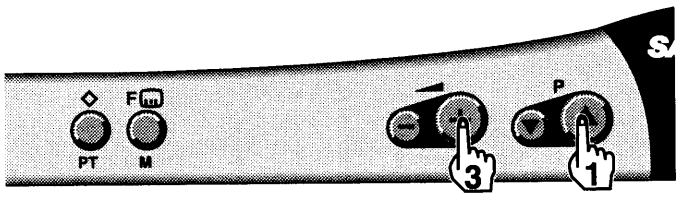
ITEM-1
Sets the current volume as the maximum volume level and prohibition of presetting.

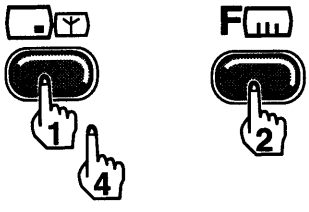
SET→ 0 NO
SET→ 1 YES

■ Start up programme position

ITEM-2
Presets the programme position when the set is switched on.

SET→ 0 Last programme position start
SET→ 1 Programme position "1" start
SET→ 2 Programme position "2" start
SET→ 3 Programme position "3" start
SET→ 4 Programme position "4" start
SET→ 5 Programme position "5" start
SET→ 6 Programme position "6" start
SET→ 7 Programme position "7" start
SET→ 8 Programme position "8" start
SET→ 9 "AV" start



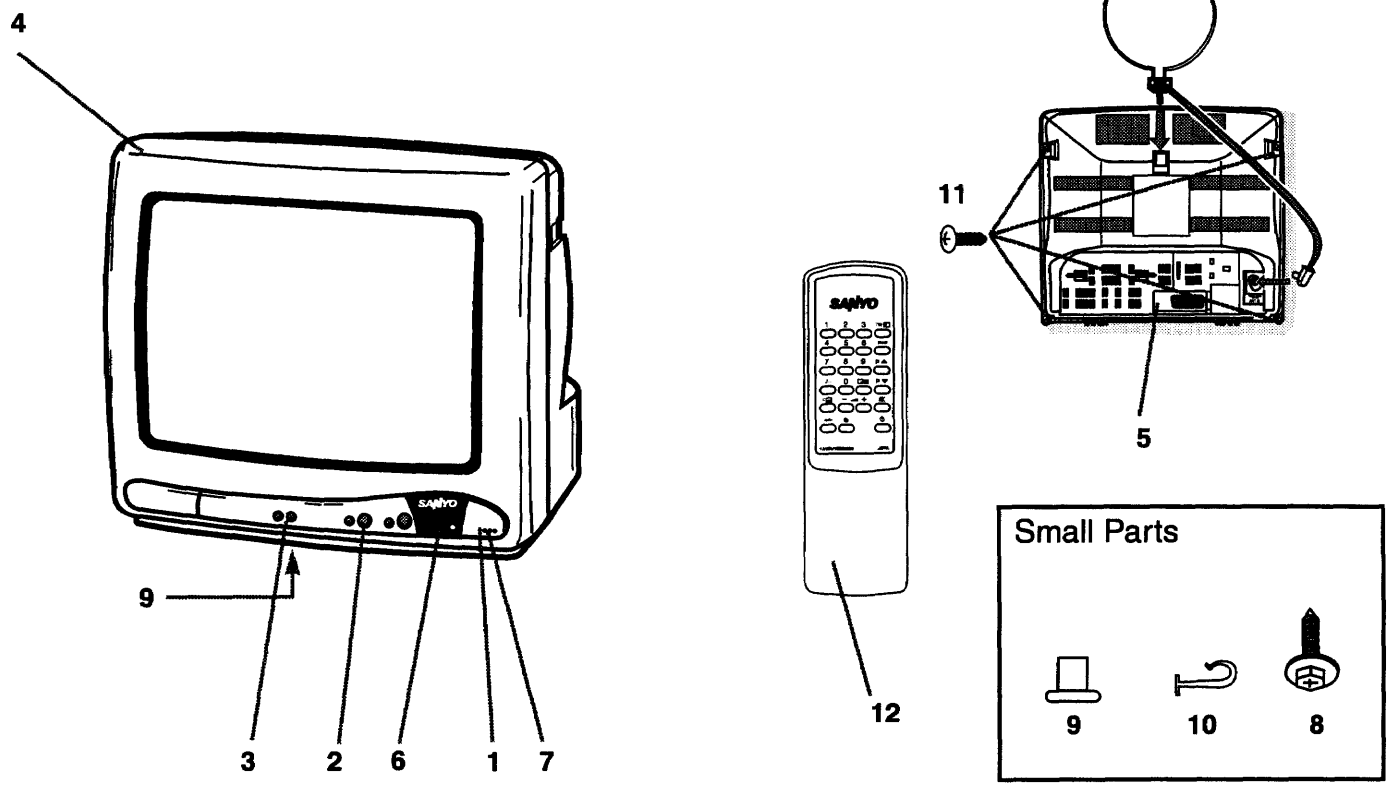


SETTING PROCEDURE

1. Press and hold the **button** on the **Remote control handset** and then press the **P▲ button** on the **TV set.**
2. To select the "ITEM" number, press the **button** on the **remote control handset.**
3. To select the "SET" number, press the + or - **button** repeatedly.
4. To return to the normal TV mode, press the **button.**

✎ The setting conditions of all items can be confirmed.
✎ Special functions are not cancelled if the TV set is switched off or the mains disconnected.

CABINET PARTS LIST SERVICE REF.NO. CE14M2-B-03



Ref. No.	Part No.	Description
CABINET PARTS		
1	610 266 5246	BUTTON POWER-F2PC
2	610 266 5253	BUTTON UNIT A-F2PC
3	610 266 5260	BUTTON UNIT B-F2PC
4	610 266 2771	CABINET FRONT-F2PC
5	610 266 3334	CABINET BACK-F2PC
6	610 260 0957	DEC BOARD-F2LC
7	610 261 3032	SPRING-E7GC
8	SKZZ0045	5mm CRT SCREW, QTY=4
9	610 098 2659	FOOT-BZYA
10	610 260 0131	DC HOLDER GBR-HBZ, QTY=4
11	411 076 1301	SCR TPG BRZ 4X14 QTY=4(BACK COVER→CABINET) QTY=2(BUTTONS→CABINET)
ACCESSORIES		
12	JXYA	RC TRANSMITTER
13	SKP10108	INSTRUCTIONS MANUAL-F2PA
14	645 000 6708	BATTERY,MANGAN,COMPOSITE
15	645 012 6291	LOOP AERIAL

CHASSIS ELECTRICAL PARTS LIST

⚠

Product safety should be considered when a component replacement is made in any area of a receiver. Components indicated by a ⚠ mark in this parts list and the circuit diagram show components whose value have special significance to product safety. It is particularly recommended that only parts specified on the following parts list be used for components replacement pointed out by the mark.

Note: Parts order must contain Service Ref. No., Part No., and descriptions.

Ref. No.	Part No.	Description

Read description in the Capacitor and Resistor as follows:

CAPACITOR

CERAMIC 100P K 50V

- Rated Voltage
- Tolerance Symbols:

  Less than 10PF

  A: Not specified B: ±0.1PF C: ±0.25PF
  D: ±0.5PF F: ±1PF G: ±2PF
  R: ±0.25-0PF S: ±0-0.25PF E: +0-1PF

  More than 10PF

  A: Not specified B: ±0.1% C: ±0.25%
  D: ±0.5% F: ±1% G: ±2%
  H: ±3% J: ±5% K: ±10%
  L: ±15% M: ±20% N: ±30%
  P: +100-0% Q: +30-10% T: +50-10%
  U: +75-10% V: +20-10% W: +100-10%
  X: +40-20% Y: +150-10% Z: +80-20%
- Rated value: P=pico farad, U=Micro farad

Material:

CERAMIC..... Ceramic
MT-PAPER..... Metallized Paper
POLYESTER..... Polyester
MT-POLYEST.... Metallized Polyester
POLYPRO..... Polypropylene
MT-POLYPRO.... Metallized Polypropylene
COMPO FILM..... Composite film
MT-COMPO..... Metallized Composite
STYRENE..... Styrene
TA-SOLID..... Tantalum Solid
AL-SOLID..... Aluminium Solid
ELECT..... Electrolytic
NP-ELECT..... Non-polarised Electrolytic
OS-SOLID..... Aluminium Solid with Organic Semiconductive Electrolytic
DL-ELECT..... Double Layered Electrolytic

RESISTOR

CARBON 4.7K J A 1/4W

- Rated Wattage
- Performance Symbols:
  A: General B: Non flammable Z: Low noise
  Other: Temperature coefficient
- Tolerance Symbols:
  A: ±0.05% B: ±0.1% C: ±0.25% D: ±0.5%
  F: ±1% G: ±2% J: ±5% K: ±10%
  M: ±20% P: +5-15%
- Rated value, ohms:
  K: 1,000, M: 1,000,000

Material:

CARBON..... Carbon
MT-FILM..... Metal Film
OXIDE-MT..... Oxide Metal Film
SOLID..... Composition
MT-GLAZE..... Metal Glaze
WIRE WOUND... Wire Wound
CERAMIC RES.. Ceramic
FUSIBLE RES.... Fusible

Ref. No.	Part No.	Description

SERVICE REF NO. CE14M2-B-03

OUT OF CIRCUIT BOARD

PICTURE TUBE

⚠Q901	414 008 8409	CRT A33LPE02X01 EKRANAS

COIL

⚠L901	645 004 8371	COIL,DEGAUSSING
	645 004 8388	COIL,DEGAUSSING

MISCELLANEOUS

SP901	610 215 6089	SPEAKER
⚠W901	645 011 8838	CORD,POWER
W902	610 024 2081	GROUNDING CONNECTOR
	610 024 2159	GROUNDING CONNECTOR

ASSY,PWB,MAIN F2PAW 1AA0B10H020EA

TRANSISTOR

Q1021	406 007 1901	TR JC556A
Q1022	406 007 2106	TR JC546A
Q1031	406 007 1901	TR JC556A
Q1032	406 007 2106	TR JC546A
Q121	406 007 2106	TR JC546A
Q151	406 007 2106	TR JC546A
Q154	406 007 1901	TR JC556A
Q161	406 007 2106	TR JC546A
Q201	406 007 2106	TR JC546A
Q241	406 007 2106	TR JC546A
Q251	406 007 1901	TR JC556A
Q431	405 013 6801	TR 2SC2274-KE-AA
Q432	405 022 6601	TR 2SD1649-CTV-YB
Q432H	610 251 0683	H HEAT SINK E7PC
Q611	406 007 1901	TR JC556A
Q612	405 058 0208	TR 2SC3807-R-CTV-YA
Q613	405 022 8506	TR 2SD1710-CTV-YB
Q613H	610 246 2807	HEAT SINK POWER-E6SG
Q631	406 007 2106	TR JC546A
Q651	405 009 7003	TR 2SB985-T
Q661	405 008 4805	TR 2SB764-E
Q682	406 007 2106	TR JC546A
Q685	406 007 2106	TR JC546A
Q686	406 007 1901	TR JC556A
Q801	405 118 4217	TR PH2369
Q831	406 007 2106	TR JC546A
Q839	406 007 2106	TR JC546A
Q861	406 007 1901	TR JC556A
Q871	406 007 2106	TR JC546A
Q872	406 007 2106	TR JC546A
Q873	406 007 2106	TR JC546A
Q874	406 007 2106	TR JC546A

INTEGRATED CIRCUIT

IC001	409 073 1509	IC AN5265
IC201	409 380 8703	IC TDA8361/N5
IC271	409 404 0201	IC U3665M
IC501	409 183 5008	IC LA7832
IC501H	610 251 8153	VERTICAL RADIATOR-E7PC

Ref. No.	Part No.	Deacription
IC661	409 367 2809	IC BA178M09T
IC661H	610 266 2542	HEAT SINK F2TC F9-4-186E
IC661P1	645 008 4058	TERMINAL PLUG
IC691	409 241 5407	IC BA178M05T
IC801	410 298 4206	IC SAA5288PS/003
IC802	409 333 3700	IC 24LC02B/P
CAPACITOR		
C001	403 043 3906	ELECT 33U M 16V
C002	403 067 7895	MT-COMPO 0.47 J 50V
C003	403 179 2715	POLYESTER 2200P J 50V
C004	403 051 0607	ELECT 4.7U M 50V
C005	403 049 4204	ELECT 10U M 50V
C006	403 049 4204	ELECT 10U M 50V
C010	403 237 8057	MT-COMPO 0.1U J 50V
C011	403 045 1504	ELECT 1000U M 25V
C012	403 047 5005	ELECT 470U M 25V
C013	403 086 2300	NP-ELECT 1U M 50V
C020	403 069 8315	CERAMIC 0.01U Z 50V
C100	403 043 9106	ELECT 47U M 16V
C1001	403 009 5718	CERAMIC 100P J 50V
C1002	403 067 7895	MT-COMPO 0.47 J 50V
C1003	403 069 9510	CERAMIC CHIP 0.01Z 50V
C1004	403 049 4204	ELECT 10U M 50V
C101	403 043 9106	ELECT 47U M 16V
C1021	403 068 0419	CERAMIC 0.1U Z 25V
C105	403 049 0008	ELECT 1U M 50V
C121	403 068 0419	CERAMIC 0.1U Z 25V
C131	401 037 5014	MT-GLAZE 0.000 ZA 1/10W
C132	403 069 1712	CERAMIC 1000P K 50V
C133	403 069 9510	CERAMIC CHIP 0.01Z 50V
C134	403 195 8408	ELECT 2.2U M 50V
C135	403 068 0419	CERAMIC 0.1U Z 25V
C136	403 194 4609	ELECT 470U M 16V
C137	403 068 0419	CERAMIC 0.1U Z 25V
C138	403 069 9510	CERAMIC CHIP 0.01Z 50V
C140	403 010 9227	CERAMIC 12P J 50V
C141	403 028 4419	CERAMIC 56P J 50V
C142	403 068 0419	CERAMIC 0.1U Z 25V
C143	403 073 4211	CERAMIC 3900P K 50V
C153	403 011 4914	CERAMIC 120P J 50V
C155	401 037 5014	MT-GLAZE 0.000 ZA 1/10W
C160	403 069 1712	CERAMIC 1000P K 50V
C161	403 072 5011	CERAMIC 270P K 50V
C171	403 086 2300	NP-ELECT 1U M 50V
C172	403 068 0419	CERAMIC 0.1U Z 25V
C173	403 049 4204	ELECT 10U M 50V
C2003	401 037 5014	MT-GLAZE 0.000 ZA 1/10W
C201	403 014 3419	CERAMIC 18P J 50V
C202	403 237 8057	MT-COMPO 0.1U J 50V
C203	403 073 9117	CERAMIC 4700P K 50V
C204	403 068 0419	CERAMIC 0.1U Z 25V
C205	403 068 0419	CERAMIC 0.1U Z 25V
C206	403 068 0419	CERAMIC 0.1U Z 25V
C207	403 068 0419	CERAMIC 0.1U Z 25V
C208	403 068 0419	CERAMIC 0.1U Z 25V
C212	403 195 8408	ELECT 2.2U M 50V
C215	403 067 7895	MT-COMPO 0.47 J 50V
C222	403 119 1409	ELECT 2.2U M 100V
C231	403 068 0419	CERAMIC 0.1U Z 25V
C233	403 068 0419	CERAMIC 0.1U Z 25V
C251	403 043 6006	ELECT 330U M 16V
C271	403 069 1712	CERAMIC 1000P K 50V
C272	403 069 1712	CERAMIC 1000P K 50V
C273	403 069 9510	CERAMIC CHIP 0.01Z 50V
C275	403 069 9510	CERAMIC CHIP 0.01Z 50V
C276	403 069 9510	CERAMIC CHIP 0.01Z 50V
C351	403 237 8057	MT-COMPO 0.1U J 50V
C352	403 179 1213	POLYESTER 4700P J 50V
C353	403 073 9117	CERAMIC 4700P K 50V
C354	403 049 0008	ELECT 1U M 50V
C361	403 072 5615	CERAMIC 2700P K 50V

Ref. No.	Part No.	Deacription
C362	403 069 9510	CERAMIC CHIP 0.01Z 50V
C363	403 042 2405	ELECT 100U M 16V
⚠ C421	404 040 8109	MT-POLYPRO 5600P J 1.5K
⚠ C423	403 078 3219	CERAMIC 270P J 3K
C426	403 067 7895	MT-COMPO 0.47 J 50V
C432	403 075 7111	CERAMIC 1000P K 500V
C433	403 076 3112	CERAMIC 3900P K 500V
C434	403 054 0703	ELECT 47U M 35V
C438	403 179 2715	POLYESTER 2200P J 50V
⚠ C441	403 311 1207	POLYPRO 0.3 U J 200V
C444	403 076 0210	CERAMIC 220P K 500V
C445	403 049 4204	ELECT 10U M 50V
C501	403 054 1502	ELECT 470U M 35V
C502	403 217 1103	ELECT 220U M 35V
C503	403 024 2112	CERAMIC 39P J 50V
C504	403 069 9510	CERAMIC CHIP 0.01Z 50V
C505	403 076 6113	CERAMIC 820P K 500V
C511	403 188 0907	MT-POLYEST 0.22U K 100V
C512	403 045 1504	ELECT 1000U M 25V
C513	403 049 4204	ELECT 10U M 50V
C520	403 009 5718	CERAMIC 100P J 50V
⚠ C601	404 060 7205	MT-POLYEST 0.1U M 250V
⚠ C602	404 060 7205	MT-POLYEST 0.1U M 250V
C606	403 076 7130	CERAMIC 1000P M 1K
C607	404 031 1003	ELECT 100U C 400V
C614	403 179 1312	POLYESTER 0.039U K 50V
C615	403 178 9418	POLYESTER 0.012U J 50V
C616	403 165 8427	CERAMIC 680P K 2K
C617	403 179 2418	POLYESTER 0.022U K 50V
⚠ C621	404 073 3904	CERAMIC 1000P M KX 250V
⚠ C624	404 073 5106	CERAMIC 470P M KX 250V
C631	403 165 6126	CERAMIC 470P K 1K
C634	403 165 6126	CERAMIC 470P K 1K
C641	404 042 4505	ELECT 220U M 160V
C643	403 054 0703	ELECT 470U M 35V
C644	403 045 1504	ELECT 1000U M 25V
C645	403 045 1504	ELECT 1000U M 25V
C662	403 194 4609	ELECT 470U M 16V
C663	403 040 3701	ELECT 220U M 10V
C685	403 049 0008	ELECT 1U M 50V
C691	403 039 6508	ELECT 100U M 10V
C801	403 069 9510	CERAMIC CHIP 0.01Z 50V
C805	403 051 0607	ELECT 4.7U M 50V
C807	403 070 2616	CERAMIC 0.1U K 50V
C814	403 051 0607	ELECT 4.7U M 50V
C819	403 051 0607	ELECT 4.7U M 50V
C824	403 049 0008	ELECT 1U M 50V
C829	403 049 0008	ELECT 1U M 50V
C834	403 049 0008	ELECT 1U M 50V
C841	403 069 9510	CERAMIC CHIP 0.01Z 50V
C861	403 179 0810	POLYESTER 0.0056U J 50V
C870	403 022 8215	CERAMIC 33P J 50V
C871	403 068 0419	CERAMIC 0.1U Z 25V
C872	403 043 9106	ELECT 47U M 16V
C873	403 018 0513	CERAMIC 22P J 50V
C874	403 018 0513	CERAMIC 22P J 50V
C875	403 068 0419	CERAMIC 0.1U Z 25V
C878	403 073 9117	CERAMIC 4700P K 50V
C879	403 068 0419	CERAMIC 0.1U Z 25V
C881	403 069 9510	CERAMIC CHIP 0.01Z 50V
C882	403 049 4204	ELECT 10U M 50V
C885	403 069 1712	CERAMIC 1000P K 50V
RESISTOR		
R001	401 018 1645	CARBON 33 JA 1/4W
R002	401 027 2323	CARBON 560 JA 1/6W
R003	401 024 7430	CARBON 10K JA 1/6W
R004	401 024 7024	CARBON 1K JA 1/6W
R006	401 024 7430	CARBON 10K JA 1/6W
R010	401 024 7024	CARBON 1K JA 1/6W
R1001	401 037 6813	MT-GLAZE 12K JA 1/10W
R1002	401 037 6813	MT-GLAZE 12K JA 1/10W

Ref. No.	Part No.	Deacription	
R1003	401 038 7710	MT-GLAZE	5.6K JA 1/10W
R1004	401 038 7611	MT-GLAZE	560 JA 1/10W
R1005	401 037 5717	MT-GLAZE	100K JA 1/10W
R1007	401 027 6628	CARBON	75 JA 1/6W
R1008	401 026 7428	CARBON	39K JA 1/6W
R1009	401 038 2210	MT-GLAZE	27K JA 1/10W
R1011	401 027 6628	CARBON	75 JA 1/6W
R1015	401 027 6628	CARBON	75 JA 1/6W
R1016	401 027 6628	CARBON	75 JA 1/6W
R1019	401 027 6628	CARBON	75 JA 1/6W
R1020	401 027 6628	CARBON	75 JA 1/6W
R1021	401 038 6317	MT-GLAZE	470 JA 1/10W
R1022	401 024 7430	CARBON	10K JA 1/6W
R1023	401 020 2053	CARBON	4.7K JA 1/4W
R1026	401 038 7611	MT-GLAZE	560 JA 1/10W
R1027	401 038 7611	MT-GLAZE	560 JA 1/10W
R1028	401 038 7611	MT-GLAZE	560 JA 1/10W
R1029	401 038 5013	MT-GLAZE	390 JA 1/10W
R1031	401 037 6714	MT-GLAZE	1.2K JA 1/10W
R1032	401 038 3613	MT-GLAZE	3.3K JA 1/10W
R1033	401 037 6714	MT-GLAZE	1.2K JA 1/10W
R109	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R110	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R121	401 038 6515	MT-GLAZE	47K JA 1/10W
R122	401 038 0919	MT-GLAZE	220K JA 1/10W
R123	401 038 0919	MT-GLAZE	220K JA 1/10W
R133	401 037 9111	MT-GLAZE	180 JA 1/10W
R134	401 038 9219	MT-GLAZE	6.8K JA 1/10W
R135	401 038 2210	MT-GLAZE	27K JA 1/10W
R137	401 037 5212	MT-GLAZE	100 JA 1/10W
R138	401 038 7710	MT-GLAZE	5.6K JA 1/10W
R141	401 038 9219	MT-GLAZE	6.8K JA 1/10W
R145	401 038 3514	MT-GLAZE	330 JA 1/10W
R150	401 037 5410	MT-GLAZE	1K JA 1/10W
R151	401 019 1040	CARBON	390 JA 1/4W
R152	401 038 3514	MT-GLAZE	330 JA 1/10W
R159	401 038 3613	MT-GLAZE	3.3K JA 1/10W
R160	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R161	401 019 1040	CARBON	390 JA 1/4W
R162	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R163	401 025 7429	CARBON	220 JA 1/6W
R164	401 038 6218	MT-GLAZE	47 JA 1/10W
R170	401 038 7710	MT-GLAZE	5.6K JA 1/10W
R171	401 037 5618	MT-GLAZE	10K JA 1/10W
R173	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R174	401 037 8015	MT-GLAZE	15K JA 1/10W
R1902	401 025 1922	CARBON	15K JA 1/6W
R1903	401 023 2842	CARBON	8K2 JA 1/4W
R1904	401 026 9927	CARBON	4K7 JA 1/6W
R1905	401 038 2111	MT-GLAZE	2.7K JA 1/10W
R1906	401 038 0711	MT-GLAZE	2.2K JA 1/10W
R1907	401 037 7919	MT-GLAZE	1.5K JA 1/10W
R1908	401 038 3514	MT-GLAZE	330 JA 1/10W
R1909	401 037 5618	MT-GLAZE	10K JA 1/10W
R1911	401 026 9620	CARBON	470 JA 1/6W
R1912	401 025 7825	CARBON	2K2 JA 1/6W
R2001	401 038 2210	MT-GLAZE	27K JA 1/10W
R2003	401 037 6813	MT-GLAZE	12K JA 1/10W
R2004	401 037 7810	MT-GLAZE	150 JA 1/10W
R201	401 039 0413	MT-GLAZE	8.2K JA 1/10W
R202	401 037 5717	MT-GLAZE	100K JA 1/10W
R203	401 037 5212	MT-GLAZE	100 JA 1/10W
R204	401 037 5212	MT-GLAZE	100 JA 1/10W
R205	401 037 5212	MT-GLAZE	100 JA 1/10W
R213	401 038 7710	MT-GLAZE	5.6K JA 1/10W
R214	401 038 2111	MT-GLAZE	2.7K JA 1/10W
R217	401 038 0810	MT-GLAZE	22K JA 1/10W
R218	401 015 2744	CARBON	1K8 JA 1/4W
R222	401 016 5843	CARBON	220K JA 1/4W
R223	401 026 4625	CARBON	33K JA 1/6W
R224	401 012 5748	CARBON	1K JA 1/4W
R226	401 037 5717	MT-GLAZE	100K JA 1/10W

Ref. No.	Part No.	Deacription	
R231	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R232	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R241	401 038 6317	MT-GLAZE	470 JA 1/10W
R242	401 025 7429	CARBON	220 JA 1/6W
R243	401 025 7429	CARBON	220 JA 1/6W
R251	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R252	401 037 5618	MT-GLAZE	10K JA 1/10W
R253	401 024 7430	CARBON	10K JA 1/6W
R271	401 016 2644	CARBON	220 JA 1/4W
R351	401 024 6720	CARBON	100 JA 1/6W
R352	401 037 5816	MT-GLAZE	1M JA 1/10W
R356	401 037 5212	MT-GLAZE	100 JA 1/10W
R357	401 037 5618	MT-GLAZE	10K JA 1/10W
R361	401 038 7918	MT-GLAZE	560K JA 1/10W
R363	401 038 5310	MT-GLAZE	39K JA 1/10W
R364	401 037 5212	MT-GLAZE	100 JA 1/10W
R365	401 038 6416	MT-GLAZE	4.7K JA 1/10W
R371	401 021 3049	CARBON	5.6K JA 1/4W
R432	401 037 5410	MT-GLAZE	1K JA 1/10W
R433	401 007 1134	CARBON	1K JA 1/2W
R434	401 009 0927	CARBON	270 JA 1/2W
R435	402 068 6008	WIRE WOUND	12 KA 5W
R444	401 062 7103	OXIDE-MT	5.6K JA 1W
R447	401 026 9927	CARBON	4K7 JA 1/6W
R448	401 009 5843	CARBON	330 JA 1/2W
R481	401 057 4704	OXIDE-MT	0.39 JA 1W
R501	401 020 2053	CARBON	4.7K JA 1/4W
R505	401 025 1922	CARBON	15K JA 1/6W
R506	401 027 8622	CARBON	8K2 JA 1/6W
R507	401 025 3827	CARBON	180 JA 1/6W
R508	401 027 2620	CARBON	5K6 JA 1/6W
R509	401 006 8411	CARBON	1.5 JA 1/2W
R511	401 008 6742	CARBON	220 JA 1/2W
R513	401 007 8440	CARBON	1.5K JA 1/2W
R514	401 025 5425	CARBON	2R2 JA 1/4W
R601	401 008 8627	CARBON	220K JA 1/2W
R602	402 060 8109	WIRE WOUND	3.9 KA 5W
R611	401 027 2620	CARBON	5K6 JA 1/6W
R615	401 016 4836	CARBON	22K JA 1/4W
R617	401 024 7024	CARBON	1K JA 1/6W
R619	401 016 2644	CARBON	220 JA 1/4W
R620	401 007 5815	CARBON	120K JA 1/2W
R621	401 007 5815	CARBON	120K JA 1/2W
R622	401 014 5241	CARBON	15K JA 1/4W
R624	401 069 1708	OXIDE-MT	68 JA 2W
R625	401 068 6902	OXIDE-MT	56 JA 2W
R626	401 017 1517	CARBON	2K7 GA 1/4W
⚠ R628	402 000 8602	SOLID	5.6M KA 1/2W
⚠ R629	402 000 8602	SOLID	5.6M KA 1/2W
R635	401 012 8145	CARBON	100K JA 1/4W
R636	401 020 2053	CARBON	4.7K JA 1/4W
R637	401 014 6149	CARBON	150K JA 1/4W
R638	401 060 9307	OXIDE-MT	27K JA 1W
R639	401 024 9721	CARBON	12K JA 1/6W
R642	401 059 3903	OXIDE-MT	1.5K JA 1W
R645	401 065 9609	OXIDE-MT	18 JA 2W
R646	401 025 7825	CARBON	2K2 JA 1/6W
R651	401 012 7049	CARBON	10K JA 1/4W
R652	401 019 1941	CARBON	3K9 JA 1/4W
R661	401 012 7049	CARBON	10K JA 1/4W
R662	401 064 6302	OXIDE-MT	10 JA 2W
R663	401 013 5341	CARBON	1K2 JA 1/4W
R666	401 008 0215	CARBON	18 JA 1/2W
R681	401 012 7049	CARBON	10K JA 1/4W
R686	401 016 5843	CARBON	220K JA 1/4W
R687	401 021 5033	CARBON	560K JA 1/4W
R688	401 012 7049	CARBON	10K JA 1/4W
R689	401 025 8228	CARBON	22K JA 1/6W
R800	401 038 0711	MT-GLAZE	2.2K JA 1/10W
R801	401 037 5014	MT-GLAZE	0.000 ZA 1/10W
R802	401 038 0711	MT-GLAZE	2.2K JA 1/10W
R803	401 037 9418	MT-GLAZE	180K JA 1/10W

Ref. No.	Part No.	Deacription
R804	401 012 7049	CARBON 10K JA 1/4W
R805	401 037 8015	MT-GLAZE 15K JA 1/10W
R806	401 066 2104	OXIDE-MT 18K JA 2W
R807	401 037 5618	MT-GLAZE 10K JA 1/10W
R812	401 038 0711	MT-GLAZE 2.2K JA 1/10W
R813	401 038 5112	MT-GLAZE 3.9K JA 1/10W
R814	401 038 3613	MT-GLAZE 3.3K JA 1/10W
R816	401 038 0711	MT-GLAZE 2.2K JA 1/10W
R817	401 037 5618	MT-GLAZE 10K JA 1/10W
R818	401 038 0810	MT-GLAZE 22K JA 1/10W
R819	401 038 6515	MT-GLAZE 47K JA 1/10W
R821	401 037 5212	MT-GLAZE 100 JA 1/10W
R822	401 037 5618	MT-GLAZE 10K JA 1/10W
R823	401 039 0413	MT-GLAZE 8.2K JA 1/10W
R824	401 026 4625	CARBON 33K JA 1/6W
R826	401 037 6714	MT-GLAZE 1.2K JA 1/10W
R827	401 038 5112	MT-GLAZE 3.9K JA 1/10W
R828	401 038 3712	MT-GLAZE 33K JA 1/10W
R831	401 037 5212	MT-GLAZE 100 JA 1/10W
R832	401 037 6813	MT-GLAZE 12K JA 1/10W
R833	401 039 0512	MT-GLAZE 82K JA 1/10W
R834	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R836	401 037 6714	MT-GLAZE 1.2K JA 1/10W
R837	401 038 6515	MT-GLAZE 47K JA 1/10W
R838	401 037 8015	MT-GLAZE 15K JA 1/10W
R839	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R840	401 020 2053	CARBON 4.7K JA 1/4W
R841	401 038 0810	MT-GLAZE 22K JA 1/10W
R842	401 019 1941	CARBON 3K9 JA 1/4W
R843	401 037 5618	MT-GLAZE 10K JA 1/10W
R844	401 037 5618	MT-GLAZE 10K JA 1/10W
R846	401 020 2053	CARBON 4.7K JA 1/4W
R847	401 012 7049	CARBON 10K JA 1/4W
R848	401 020 2053	CARBON 4.7K JA 1/4W
R852	401 012 5748	CARBON 1K JA 1/4W
R856	401 016 4836	CARBON 22K JA 1/4W
R861	401 038 2111	MT-GLAZE 2.7K JA 1/10W
R862	401 038 0810	MT-GLAZE 22K JA 1/10W
R863	401 038 0810	MT-GLAZE 22K JA 1/10W
R864	401 038 0711	MT-GLAZE 2.2K JA 1/10W
R865	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R866	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R867	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R868	401 037 6714	MT-GLAZE 1.2K JA 1/10W
R869	401 038 2210	MT-GLAZE 27K JA 1/10W
R870	401 038 0810	MT-GLAZE 22K JA 1/10W
R871	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R872	401 038 3712	MT-GLAZE 33K JA 1/10W
R873	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R874	401 037 5618	MT-GLAZE 10K JA 1/10W
R875	401 038 7710	MT-GLAZE 5.6K JA 1/10W
R876	401 037 5618	MT-GLAZE 10K JA 1/10W
R877	401 039 0413	MT-GLAZE 8.2K JA 1/10W
R878	401 037 7919	MT-GLAZE 1.5K JA 1/10W
R879	401 012 7049	CARBON 10K JA 1/4W
R881	401 038 2210	MT-GLAZE 27K JA 1/10W
R883	401 020 0841	CARBON 470 JA 1/4W
R884	401 038 2111	MT-GLAZE 2.7K JA 1/10W
R885	401 038 5112	MT-GLAZE 3.9K JA 1/10W
R887	401 038 5112	MT-GLAZE 3.9K JA 1/10W
R891	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R892	401 038 6416	MT-GLAZE 4.7K JA 1/10W
R895	401 037 6714	MT-GLAZE 1.2K JA 1/10W

VARIABLE RESISTOR

VR131	645 006 5422	VR,SEMI,10K N
VR361	645 006 5422	VR,SEMI,10K N
VR501	645 006 5408	VR,SEMI,100 N
VR631	645 006 5514	VR,SEMI,2.2K N

COIL

L1002	645 001 4550	PEAKING COIL 10UHK
L1003	645 001 4550	PEAKING COIL 10UHK
L1006	645 001 4550	PEAKING COIL 10UHK
L1021	645 002 4511	CORE,PIPE
L103	645 003 8549	PEAKING COIL
L141	645 001 4550	PEAKING COIL 10UHK
L151	645 003 8334	PEAKING COIL 18UHK 26MM T
L161	645 001 4550	PEAKING COIL 10UHK
L201	645 003 8518	PEAKING COIL
L202	645 003 8518	PEAKING COIL
L203	645 003 8518	PEAKING COIL
L431	610 032 5869	FILTER COIL
L444	610 210 9689	COIL
L445	610 210 9689	INDUCTOR,150U K
L521	645 008 1286	PEAKING COIL
⚠ L601	645 012 3337	LINE FILTER
L607	610 237 1000	PIPE CORE
L608	610 237 1000	PIPE CORE
L611	645 002 4511	CORE,PIPE
L612	645 002 4511	CORE,PIPE
L615	645 002 4511	CORE,PIPE
L801	645 006 4326	PEAKING COIL 2R7UH K 26MM
L803	645 015 5390	PEAKING COIL R39UH K 26MM
L811	645 003 8549	PEAKING COIL
L816	645 003 8549	PEAKING COIL
L821	645 003 8549	PEAKING COIL
L826	645 003 8549	PEAKING COIL
L831	645 003 8549	PEAKING COIL
L832	645 003 8549	PEAKING COIL
L841	645 008 2962	PEAKING COIL 5.6UH K
L871	645 008 2962	PEAKING COIL 5.6UH K
L881	645 001 4543	PEAKING COIL

DIODE

D001	408 007 8607	DIODE 1N4148
D002	408 007 8607	DIODE 1N4148
D1007	407 063 8319	ZENER DIODE MTZJ11C
D1011	407 063 8319	ZENER DIODE MTZJ11C
D1015	407 063 8319	ZENER DIODE MTZJ11C
D1016	407 063 8319	ZENER DIODE MTZJ11C
D1019	407 063 8319	ZENER DIODE MTZJ11C
D1020	407 063 8319	ZENER DIODE MTZJ11C
D1021	407 012 4416	DIODE 1SS133-T-77
D1031	407 012 4416	DIODE 1SS133-T-77
D1032	407 012 4416	DIODE 1SS133-T-77
D135	407 063 8319	ZENER DIODE MTZJ11C
D1910	407 120 9706	LED LN28RPL
D1910A	610 269 4703	HOLDER LED A-E6YC
D222	408 007 8607	DIODE 1N4148
D251	407 012 4416	DIODE 1SS133-T-77
D252	407 012 4416	DIODE 1SS133-T-77
D253	407 012 4416	DIODE 1SS133-T-77
D254	407 012 4416	DIODE 1SS133-T-77
D271	407 053 6407	ZENER DIODE MTZ5.1C-T-77
D351	407 053 8708	ZENER DIODE MTZ9.1A-T-77
D361	407 063 8319	ZENER DIODE MTZJ11C
D445	407 012 4416	DIODE 1SS133-T-77
D446	407 012 4416	DIODE 1SS133-T-77
D447	407 053 8104	ZENER DIODE MTZ7.5C-T-77
D501	407 005 7328	DIODE EM01Z
D603	407 009 6921	DIODE RM11C
D604	407 009 6921	DIODE RM11C
D605	407 009 6921	DIODE RM11C
D606	407 009 6921	DIODE RM11C
D614	408 007 8607	DIODE 1N4148
⚠ D615A	407 173 2907	PHOTO COUPLE PC123F2
D616	408 007 8607	DIODE 1N4148
D617	407 007 6616	DIODE ES1
D631	407 007 7712	DIODE EU2A
D633	407 007 6616	DIODE ES1
D634	407 007 7613	DIODE EU2
D635	407 007 6616	DIODE ES1
D641	407 053 7503	ZENER DIODE MTZ6.8A 26MM
D643	408 007 8607	DIODE 1N4148

Ref. No.	Part No.	Deacription
D644	408 007 8607	DIODE 1N4148
D645	408 007 8607	DIODE 1N4148
D646	407 053 8302	ZENER DIODE MTZ8.2A-T-77
D649	408 007 8607	DIODE 1N4148
D661	407 005 8612	DIODE ERA15-02 26MM
D669	408 007 8607	DIODE 1N4148
D683	408 007 8607	DIODE 1N4148
D685	407 053 7503	ZENER DIODE MTZ6.8A 26MM
D805	409 026 8005	IC L5630
D861	407 012 4416	DIODE 1SS133-T-77
D862	408 007 8607	DIODE 1N4148
D871	408 007 8607	DIODE 1N4148
D872	407 055 7927	ZENER DIODE RD3.6EL

MISCELLANEOUS

⚠F601	423 022 2102	FUSE 250V 4A
F601-A1	645 000 5077	HOLDER,FUSE
F601-A2	645 000 5077	HOLDER,FUSE
A101	645 023 4125	TUNER,U
A101P1	645 008 4058	TERMINAL,PLUG
A101P2	645 008 4058	TERMINAL,PLUG
A1901	645 028 1044	REMO REC SPS-443-1-E
K1001	645 005 5867	SOCKET,RGB 21P
	610 234 3779	SOCKET 21P
K1001Z	610 261 2813	MOUNTING-BRKT F2WV
⚠PS601	408 003 6805	THERMISTOR 902P44E180MR14
	408 015 1904	THERMISTOR PA3A5180B270
SW1901	610 011 2698	SWITCH,PUSH
SW1902	610 011 2698	SWITCH,PUSH
SW1903	610 011 2698	SWITCH,PUSH
SW1904	610 011 2698	SWITCH,PUSH
SW1905	610 011 2698	SWITCH,PUSH
SW1906	610 011 2698	SWITCH,PUSH
⚠SW601	645 024 0607	PUSH SW POWER SDDFC3
X131	421 001 3300	SAW F TSF5305
X151	645 001 7902	TRAP,CERAMIC 6.0MHZ
X161	645 003 2813	CERAMIC FILTER
X201	645 018 9050	OSC,CRYSTAL 4.433619MHZ
X871	645 018 9593	OSC,CRYSTAL 12MHZ
Z101	610 259 7813	SHIELD CASE-A-F2RC
Z102	610 266 2535	SHIELD CASE-B-F2TC
Z801	610 267 0417	SHIELD CASE-C-F2PE

ASSY,PWB,CRT F2PAW 1AA0B10H020EB

TRANSISTOR

Q701	406 006 1902	TR BF422
Q711	406 006 1902	TR BF422
Q721	406 006 1902	TR BF422
Q741	406 007 1901	TR JC556A

CAPACITOR

C701	403 074 5712	CERAMIC	560P K	50V
C711	403 073 6403	CERAMIC	470P K	50V
C721	403 073 6403	CERAMIC	470P K	50V
C731	403 077 2807	CERAMIC	1000P Z	2K

RESISTOR

R701	401 018 2800	CARBON	330 JA	1/4W
R702	401 019 1901	CARBON	3.9K JA	1/4W
R703	401 021 1906	CARBON	560 JA	1/4W
R704	401 065 4604	OXIDE-MT	12K JA	2W
R705	401 009 6602	CARBON	3.3K JA	1/2W
R711	401 018 2800	CARBON	330 JA	1/4W
R712	401 019 1901	CARBON	3.9K JA	1/4W
R713	401 013 5301	CARBON	1.2K JA	1/4W
R714	401 065 4604	OXIDE-MT	12K JA	2W
R715-M	401 009 6602	CARBON	3.3K JA	1/2W
R721	401 018 2800	CARBON	330 JA	1/4W
R722	401 019 1901	CARBON	3.9K JA	1/4W
R723	401 015 2704	CARBON	1.8K JA	1/4W
R724	401 065 4604	OXIDE-MT	12K JA	2W
R725-M	401 009 6602	CARBON	3.3K JA	1/2W
R727	401 021 1906	CARBON	560 JA	1/4W
R741	401 020 2003	CARBON	4.7K JA	1/4W
R742	401 018 3807	CARBON	3.3K JA	1/4W
R744	401 018 2800	CARBON	330 JA	1/4W

VARIABLE RESISTOR

VR701	645 003 5722	VR,SEMI,4.7K N
VR702	645 003 5647	VR,SEMI,1K N
VR711	645 003 5722	VR,SEMI,4.7K N
VR712	645 003 5647	VR,SEMI,1K N
VR721	645 003 5722	VR,SEMI,4.7K N

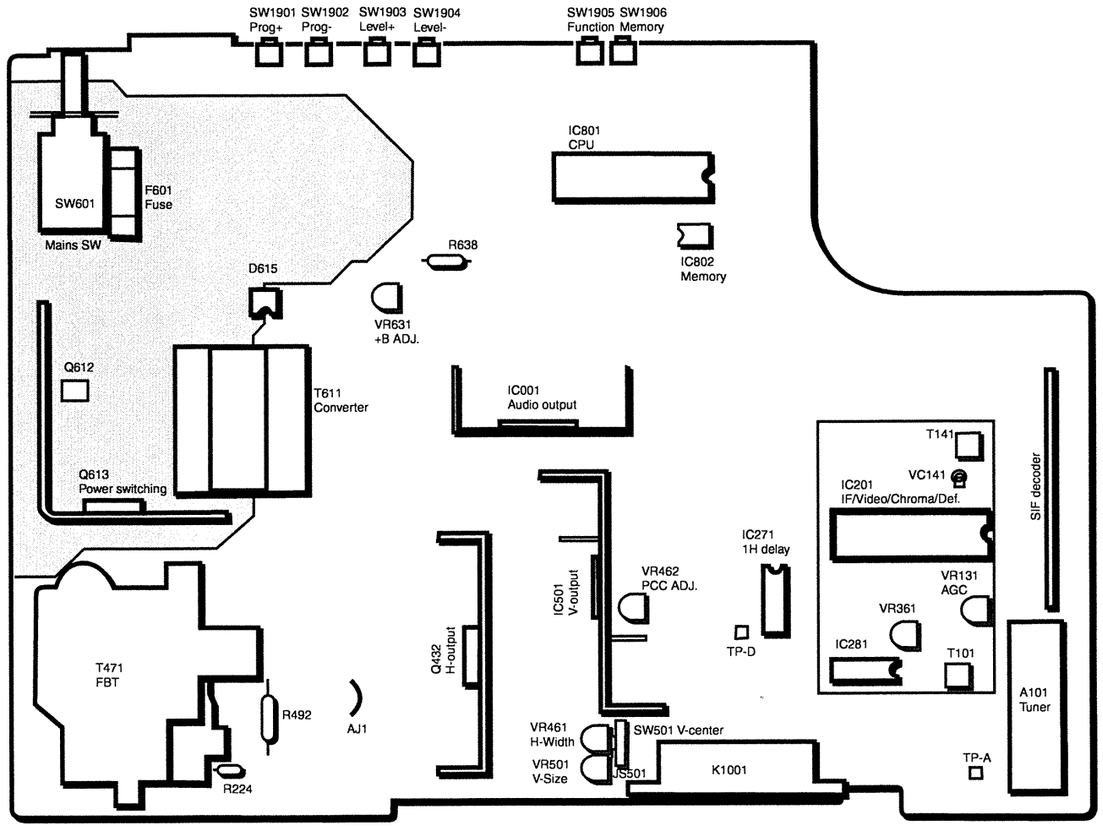
MISCELLANEOUS

⚠K701-M	645 009 3821	CRT SOCKET NARROW NECK

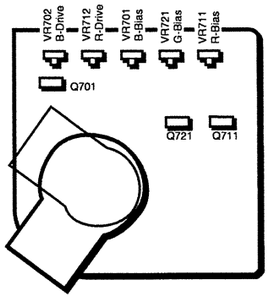
Ref. No.	Part No.	Deacription	Ref. No.	Part No.	Deacription

Ref. No.	Part No.	Deacription	Ref. No.	Part No.	Deacription

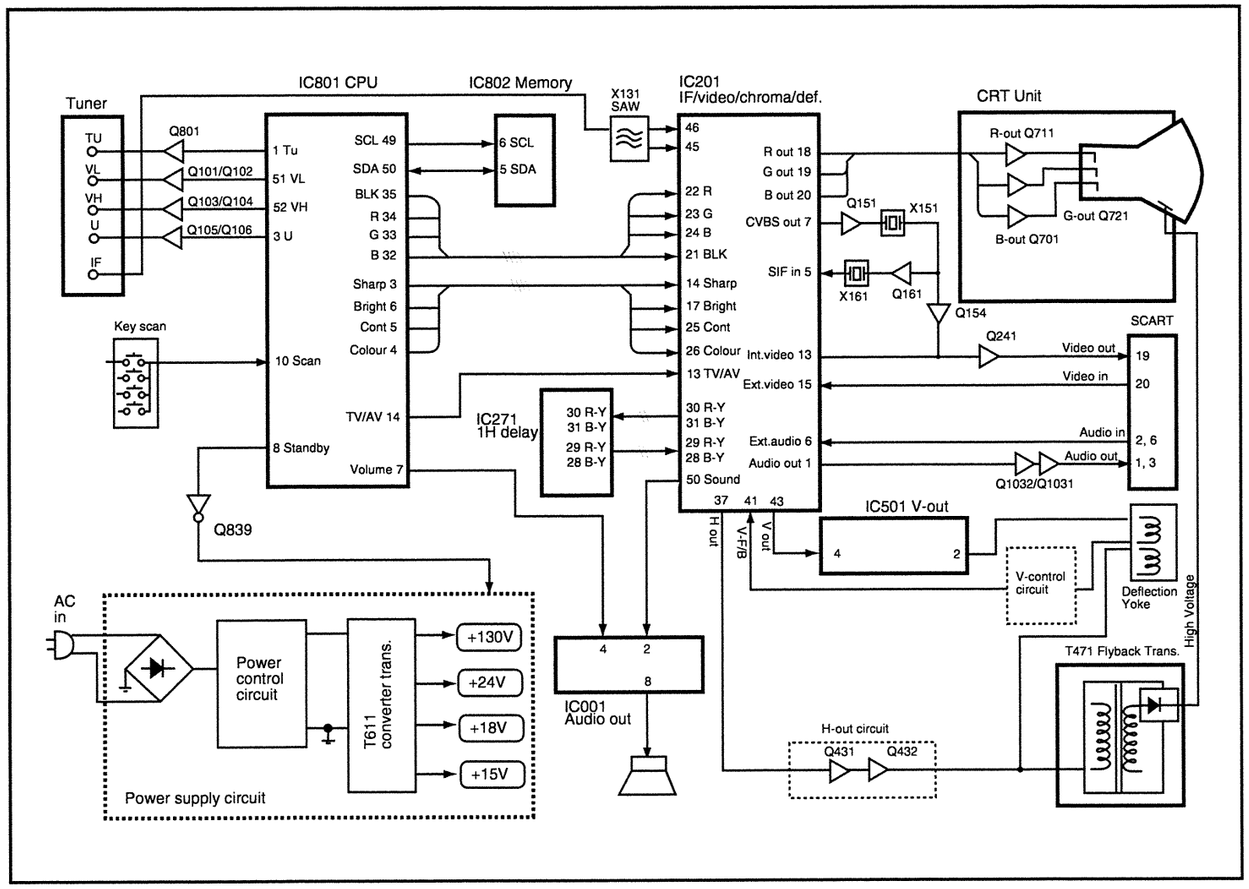
Main Board
Component Location

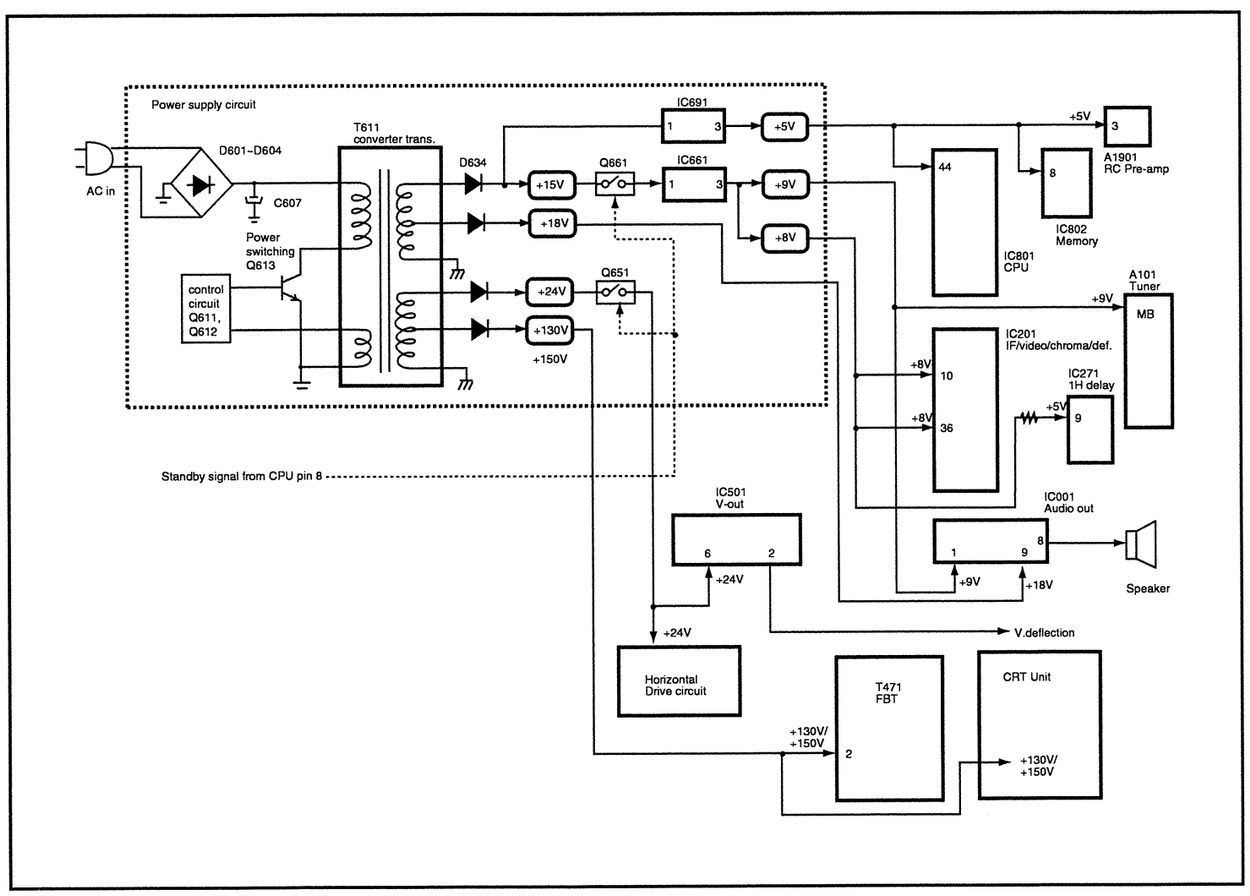


CRT Board
Component Location

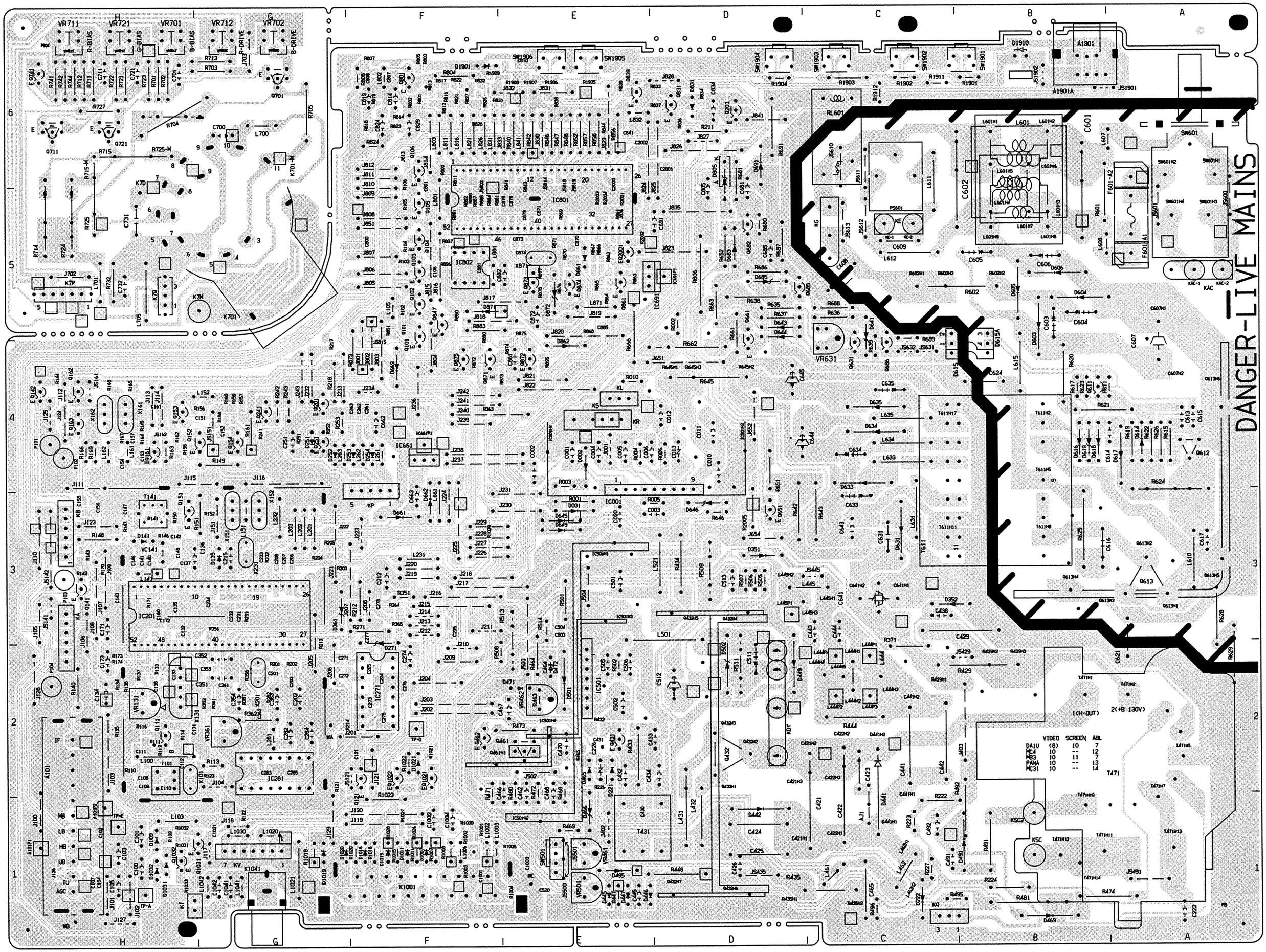


GENERAL BLOCK DIAGRAMS FOR EC5 CHASSIS

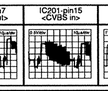
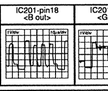
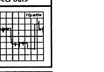
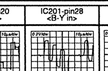
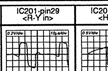
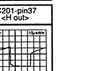
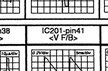
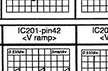
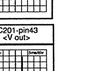
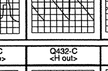
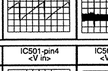
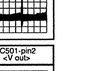
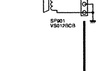
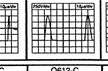
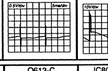
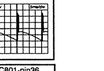
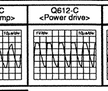




Main/CRT Board
Circuit side



Waveforms on ICs and Transistors

IC201-pin7 <CVBS out>	IC201-pin15 <CVBS in>	IC201-pin18 <B out>	IC201-pin19 <G out>
			
IC201-pin20 <R out>	**IC201-pin28 <B-Y in>**	**IC201-pin29 <R-Y in>**	**IC201-pin37 <H out>**
			
IC201-pin38 <H FB>	**IC201-pin41 <V FB>**	**IC201-pin42 <V ramp>**	**IC201-pin43 <V out>**
			
Q431-C <H drive>	**Q432-C <H out>**	**IC501-pin4 <V in>**	**IC501-pin2 <V out>**
			
Q611-C <Power amp>	**Q612-C <Power drive>**	**Q613-C <power out>**	**IC801-pin36 <CPU H in>**
			
IC801-pin37 <CPU V in>			
			

Voltage on ICs

IC001													
1	1.6V	2	1.6V	3	15.5V	4	1.6V	5	1.6V	6	0V	7	-
8	13.8V	9	28.6V	10	14.0V	11	0V						
IC201													
1	3.1V	2	6.0V	3	6.0V	4	6.1V	5	0V	6	4.0V	7	3.1V
8	1.6V	9	0V	10	8.0V	11	0V	12	3.6V	13	4.4V	14	3.2V
15	3.9V	16	0V	17	3.4V	18	2.5V	19	2.5V	20	2.5V	21	0.2V
22	3.4V	23	3.4V	24	3.4V	25	2.9V	26	1.6V	27	5.9V	28	4.0V
29	4.0V	30	1.5V	31	1.5V	32	0V	33	4.9V	34	3.5V	35	2.6V
36	8.0V	37	0.9V	38	0.7V	39	3.0V	40	4.0V	41	2.5V	42	0V
43	0.8V	44	4.1V	45	4.1V	46	4.1V	47	7.0V	48	3.1V	49	1.6V
50	3.6V	51	4.3V	52	6.7V								
IC271													
1	5.3V	2	0V	3	0V	4	0V	5	0.7V	6	0V	7	0V
8	0V	9	5.2V	10	0V	11	3.1V	12	3.1V	13	0V	14	1.3V
15	0V	16	1.3V										
IC501													
1	0V	2	13.4V	3	25.3V	4	0.7V	5	0.7V	6	25.2V	7	2.1V
IC801													
1	0.6V	2	2.4V	3	3.7V	4	1.8V	5	2.1V	6	0V	7	0V
8	0V	9	2.6V	10	0.5V	11	2.5V	12	0V	13	0V	14	3.7V
15	0V	16	0V	17	0V	18	0V	19	0V	20	0V	21	0V
22	0V	23	2.2V	24	0.2V	25	2.0V	26	2.3V	27	0V	28	0V
29	5.0V	30	5.0V	31	5.0V	32	0V	33	0V	34	0V	35	0V
36	0.6V	37	0.2V	38	4.9V	39	4.9V	40	0V	41	2.1V	42	2.4V
43	0V	44	4.9V	45	4.7V	46	5.4V	47	5.0V	48	0V	49	4.8V
50	4.8V	51	0V	52	2.9V								
IC802													
1	0V	2	0V	3	0V	4	0V	5	4.8V	6	4.8V	7	0V
8	5.0V												

Voltage on Transistors

Q001		Q121		Q151	
E	0V	E	2.8V	E	3.8V
C	15.5V	C	8.0V	C	0V
B	0.1V	B	3.3V	B	3.2V

Q152		Q153		Q154	
E	3.2V	E	9.3V	E	3.1V
C	8.7V	C	2.3V	C	0V
B	0V	B	8.7V	B	2.4V

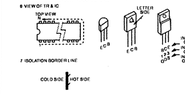
Q203		Q431		Q432	
E	0V	E	0V	E	0V
C	6.0V	C	10.8V	C	--
B	0V	B	0.3V	B	0V

Q611		Q612		Q613	
E	10.8V	E	0V	E	0V
C	-1.4V	C	-1.1V	C	--
B	10.5V	B	-1.4V	B	-1.1V

Q861		Q871		Q872	
E	5.0V	E	0V	E	0V
C	2.5V	C	6.3V	C	0.2V
B	5.0V	B	0.1V	B	0.6V

Q682		Q873		Q874	
E	5.0V	E	0V	E	4.9V
C	0.1V	C	0V	C	4.9V
B	5.6V	B	0.8V	B	5.6V

NOTES:
1. RESISTORS SPECIFIED WITH RESISTANCE VALUE ARE 1/4BJ
2. RESISTORS SPECIFIED WITH TYPE OF RESISTOR TOLERANCE AND RESISTANCE VALUE ARE 1/4W
3. [illegible]
4. [illegible]
5. [illegible]
6. VIEW OF TR & IC



7. ISOLATION BORDER LINE

8. LIST OF REPLACEABLE DIODES

M (X10600G)	1S2176, 1S5133, D3A20
R (X10600H)	1S2076, 1S2473, DS442, 1N4148
AA (X10600AB)	1S2076, 1S2473, DS442, 1N4148, 1S5133
P (X10600G1)	1S2076A,1S2471, 1N4148

9. LIST OF REPLACEABLE TRANSISTORS

	2SC1740S	2SC945A	2SC1815
A3 (17200183)	Q,R,S	Q,P	Y,GR
AC (X07200395)	Q,R,S	R,Q,P	Y,GR,O
	2SA933S	2SA564A	2SA1015
A3 (17200183)	Q,R	R	Y,GR
AC (17200180)	R	Q,R	Y,GR,O

10. "J" JUMPER WIRE
"R" PART NOT USED

Circuit diagram notes :

1. All resistance values are in ohms, K=1,000, M=1,000,000.
2. All resistance rated wattages are 1/6W unless otherwise noted.
3. Excepting electrolytic capacitors, all capacitance values of less than 1 are expressed in µF and more than 1 are pF.
4. All capacitance rated voltages are 50V unless otherwise noted.
5. All inductance values are in µH.
6. Voltage readings taken a digital voltmeter are from point indicated chassis ground. Voltage readings taken by using a colour bar signal are with all controls at normal position. Some voltages may vary with signal strength.
7. Waveforms were taken with colour bar and controls adjusted for normal picture. Waveforms were taken by using a wide band oscilloscope and a low capacity probe.
8. This circuit diagram covers a basic or representative chassis only. There may be some components or partial circuit differences between the actual chassis and the circuit diagram.
9. ■ Diode 1S1555 may be replaced with 1S2473, 1S2076 or DS472 unless otherwise noted.
■ Transistor 2SC536(Q,R,S), 2SC1740(Q,R,S), 2SC945A(Q,R,P) or 2SC1815(G,O,Y) unless otherwise noted.
■ Transistor 2SA608(E,F) may be replaced with 2SA933(Q,R), 2SA564(QA,RA), or 2SA1015(O,Y) unless otherwise noted.

Expression of capacitance and resistance in circuit diagram.

Capacitance (Example)

1000 C M 2000 D

- Characteristic
- Capacitance value (220pF)
- Tolerance (±20%)
- Kind(Ceramic)
- Rated voltage (1,000V)

J= ± 5%
K= ± 10%
M= ± 20%

T, A, U, D : Electrolytic
C, K, B : Ceramic
F : Mylar film
M, N : Polypropylene
Z : Metallized paper

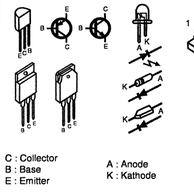
Resistance (Example)

1/2 N J 1.2

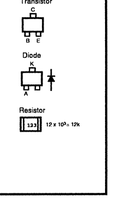
- Resistance value (1.2Ω)
- Tolerance (±5%)
- Kind (M.carbon)
- Rated wattage(1/2W)

D : Carbon
N : Metallized carbon
S : Oxide metallized
W : Wire wounding
C : Solid

Terminal guide



Chip Components



COLOUR MONITOR

SANYO

CHASSIS SERIES EC5

MODEL NUMBER CE14M2-B

SERVICE REF.NO. CE14M2-B-03

The service Precaution:
The area enclosed by this line (⚠) is directly connected with AC mains voltage. When servicing the area, connect an isolating transformer between TV receiver and AC line to eliminate hazard of electric shock.

Product safety notice:
Product safety should be considered when a component replacement is made in any area of a receiver. Components indicated by a mark ⚠ in this circuit diagram show components whose values have special significance to product safety. It is particularly recommended that only parts specified on the part service manual be used for components replacement pointed out by the mark.